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How We Bring You Some of The **Purest Water** in America.

Massachusetts
WaterResources
Authority

Where does our water come from?

Nearly half of the population of Massachusetts, including most of Greater Boston, receives water from the Quabbin and Wachusett reservoirs. Located in central Massachusetts, the Quabbin holds 412 billion gallons when full and is the largest single-purpose reservoir in the United States. The Wachusett, located in Clinton, is capable of holding 65 billion gallons.

From these reservoirs, a network of 400 miles of MWRA tunnels, aqueducts and large pipes feeds the more than 6,000 miles of smaller pipes owned by the communities. Water is distributed to households and industries through these smaller pipes. This vast system, completed in the 1930s, supplies more than 2 million people with some of the purest water in the nation.

The system is jointly operated by the Metropolitan District Commission (MDC) and the Massachusetts Water Resources Authority (MWRA). The MDC owns and manages the reservoirs and the watershed areas around them. The MWRA supplies water to each community through its water distribution system.

Why is our water so clean?

The combined waters of the Quabbin and Wachusett reservoirs and the Ware River provide Greater Boston with remarkably clean water. There are two reasons for the water's purity. The first is that the area around Quabbin and the Ware River is sparsely populated and almost entirely forested. The state bought much of the watershed when the reservoir was created, assuring a pristine environment in which to collect the water. As a result, there are no septic tanks, little industry and few cars to pollute it.

The other reason for the water's purity is the sheer size of the Quabbin. Its water moves slowly, taking as long as four years to reach the aqueduct that brings it through the system. In that time impurities settle to the bottom, leaving the water clean and pure.

1. How was our water system created?

By the mid-1800s, Boston and surrounding communities had developed a reasonably sophisticated water delivery system. This system utilized wooden pipes fashioned from tree trunks to transport water from a series of area reservoirs such as Jamaica Pond.

By the end of the 19th century, however, the population of the Boston area had expanded so rapidly that even the addition of Lake Cochituate and the Sudbury Reservoir could not meet the growing demand for water. But in 1895, Frederic Stearns, chief engineer for the State's Board of Public Health, designed and built the Wachusett Reservoir and began the design that would lead to the construction of the Quabbin.

The Quabbin project displaced the inhabitants of four towns and several villages, requiring the destruction or relocation of some 2,500 homes. Construction was completed in 1939 at a cost of \$53 million. Today, Quabbin covers 39 square miles and continues to provide the MWRA's communities with pure water.

2. Who uses water from Quabbin?

Forty-six communities are eligible to draw water from the MWRA system:

Arlington, Belmont, Boston, Brookline, Cambridge, Canton, Chelsea, Chicopee, Clinton, Dedham, Everett, Framingham, Leominster, Lynn, Lynnfield Water District, Lexington, Malden, Marblehead, Marlborough, Medford, Melrose, Milton, Nahant, Needham, Newton, Northborough, Norwood, Peabody, Quincy, Revere, Saugus, Somerville, Southborough, South Hadley Fire District #1, Stoneham, Swampscott, Waltham, Wakefield, Watertown, Wellesley, Weston, Wilbraham, Winchester, Winthrop, Woburn, Worcester.

All of these communities are responsible for maintaining their own pipes and providing retail service to their own customers.

3. How does the water get to my tap?

Water flows into the reservoirs from surface streams and rivers (see diagram). The Quabbin (A) is fed by the Swift River and by flood flows diverted from the Ware River (B) between October and June. The Wachusett (C) is fed by the Stillwater and Quinapoxet rivers. Water entering Quabbin takes up to four years to circulate (Q) and enter the main intake (E). Water is released down the 25-mile-long Quabbin aqueduct (F) to replenish the Wachusett. A second aqueduct (G) serves communities in the Chicopee Valley; water is also released from Winsor Dam to keep the Swift River flowing (H).

Water enters Wachusett at Oakdale (I) and circulates for eight months before being drawn off in Clinton (J). Electric power is generated as the water both enters and leaves the reservoir and at two other stations (K) in the system. The water then passes under the Sudbury Reservoir, which is not presently used, to Southborough (L). Here fluonide, a mineral that helps prevent tooth decay, is added to the water. An alkaline chemical is also added to lower the water's acidity. This helps lessen the corrosion of the lead pipes still used in some older communities and homes.

The water continues through the Hultman and Weston aqueducts (M), emptying into the Norumbega (N) and Weston (O) reservoirs. It is then chlorinated as it is drawn into distribution mains (P), which feed nine small reservoirs and storage tanks such as Spot Pond (Q) and the many smaller pipes serving the region. Water meters log the water entering each community. Local pipes service each street and eventually carry water into buildings. Each line is metered by the local community and feeds into the plumbing in the building.

4. How clean is my drinking water?

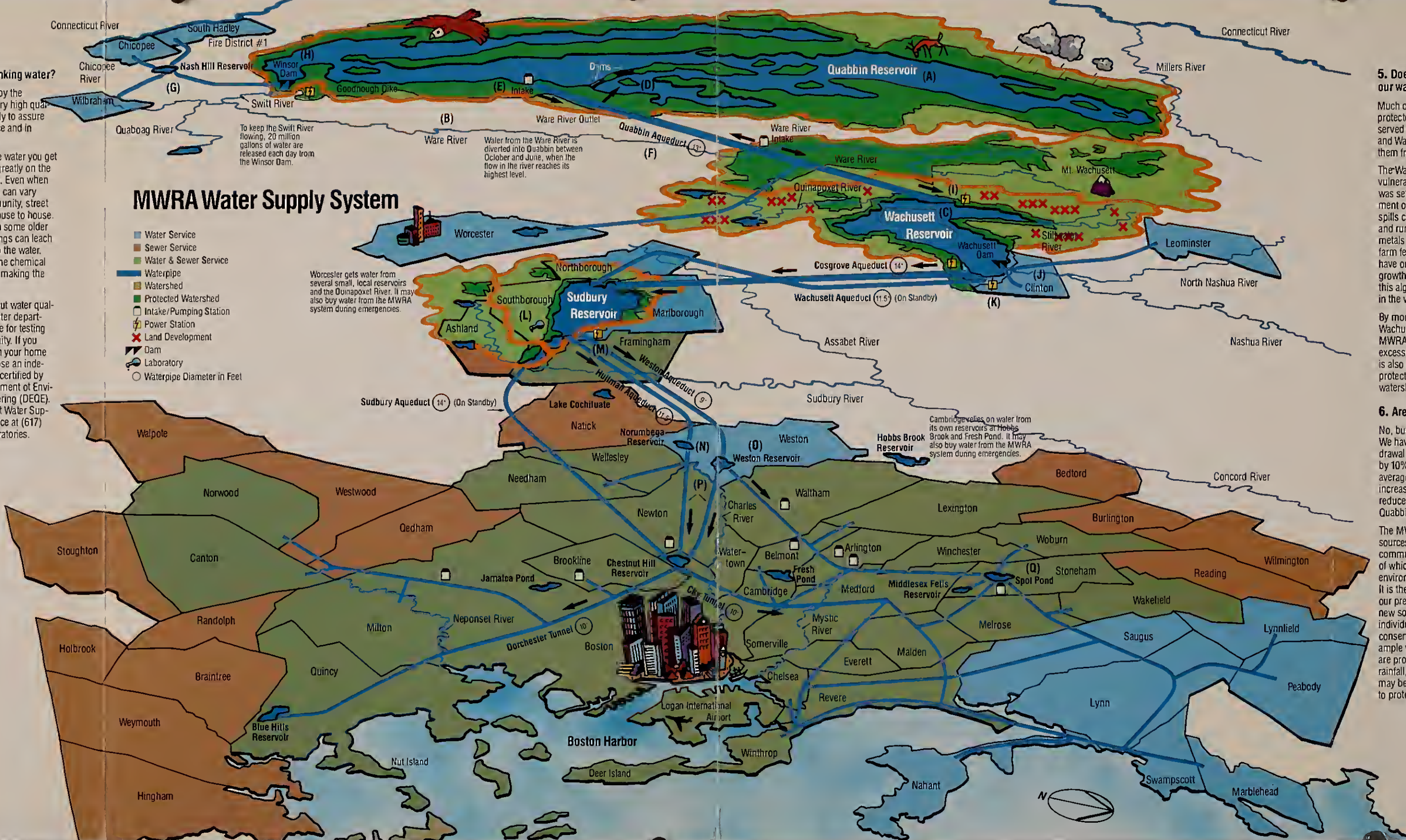
The communities served by the MWRA system receive very high quality water. It is tested weekly to assure its safety, both at its source and in the communities.

However, the quality of the water you get from the faucet depends greatly on the pipes in your local system. Even when the supply is pure, quality can vary from community to community, street to street and even from house to house. The lead pipes still used in some older neighborhoods and buildings can leach small amounts of lead into the water. The MWRA adds an alkaline chemical to reduce this leaching by making the water less acidic.

You can find out more about water quality by calling your local water department, which is responsible for testing the water in your community. If you decide to have the water in your home evaluated, be sure to choose an independent laboratory that is certified by the Massachusetts Department of Environmental Quality Engineering (DEQE). Contact DEQE's Division of Water Supply Public Information Office at (617) 292-5770 for a list of laboratories.

MWRA Water Supply System

- Water Service
- Sewer Service
- Water & Sewer Service
- Waterpipe
- Watershed
- Protected Watershed
- Intake/Pumping Station
- Power Station
- Land Development
- Dam
- Laboratory
- Waterpipe Diameter in Feet



5. Does pollution threaten our water?

Much of the MWRA water supply is well protected. The state purchased and preserved large portions of the Quabbin and Ware River watersheds, saving them from development.

The Wachusett Reservoir, however, is vulnerable. Not enough of its watershed was set aside originally and development on it has continued. Accidental spills can occur on bordering roadways and runoff may contain salt and toxic metals. Runoff rich in nutrients from farm fertilizers and large septic systems have on occasion promoted the excess growth of algae. Although harmless, this algae causes a fishy taste and odor in the water supply.

By monitoring and treating the Wachusett Reservoir, however, the MWRA is significantly reducing the excessive growth of algae. The MWRA is also supporting measures that will protect more of the Wachusett watershed.

6. Are we running out of water?

No, but it is important that we conserve. We have been exceeding the safe withdrawal level from Quabbin and Wachusett by 10% for several years. Lower than average rainfall, combined with this increased demand, has significantly reduced Quabbin's supply. As a result, Quabbin has not been full since 1984.

The MWRA could tap major new sources of water only by flooding a community or diverting a river, neither of which would make sense from an environmental or economic perspective. It is therefore more prudent to conserve our present water supply than to seek new sources. With the cooperation of individuals, businesses and industry, conservation programs can ensure ample water supplies. However, if there are prolonged periods of below normal rainfall, mandatory conservation efforts may be required of the cities and towns to protect the existing water supply.

7. How much water can be saved?

The goal of the MWRA long-range water supply program is to reduce water use well below the 300 million gallon per day safe yield of the water system. This will ensure adequate supplies during drought periods and provide ample supplies for future growth in the metropolitan area.

The key elements of the MWRA's water conservation program include protection of local water supplies, public education, technical assistance to institutional and commercial users, and pilot programs to install water-saving fixtures in homes.

In addition, the MWRA is finding and fixing leaks in its own system and assisting communities to detect leaks in their local pipes. The age of the pipes is a major reason for the leaks. Many of the smaller pipes are more than 50 years old; some date back to the 1840s.

8. Is there anything one person can do?

Absolutely. Each of us can contribute by fixing household leaks and by installing faucet aerators, water-saving shower heads and low-flow toilets, as well as by choosing appliances that are water-efficient. The average person uses 60 gallons of water per day. With an awareness of conservation methods, this figure can be reduced to 35-40 gallons a day.

The pure, clean water in the MWRA system has many uses. It is used for drinking, showering, watering lawns, washing dishes, washing cars, flushing toilets, and in industrial processes. That means there are many opportunities for conservation and every individual effort can mean a significant savings.

The MWRA offers a free Home Water Conservation Guide that explains how you can save water in your home. Call (617) 242-SAVE for a copy.

9. Who pays for the water?

We all do. MWRA charges the local communities for the water they use. In turn, the communities bill customers in their service area for the costs of maintaining their local systems and for water use in each home and business.

The MWRA provides wholesale water and sewer services to 60 communities. Some communities purchase only water service, some only sewer, but most buy both. The MWRA keeps separate accounts for water and sewer service; revenues from water service are applied solely to the operation and maintenance costs of the water system. Revenues from sewer service are applied only to sewer system costs.

The MWRA has increased its wholesale water rate to communities to pay for renovating and upgrading the water system and to support water conservation efforts. Also, charges to communities for sewer service are being increased to pay for the construction of new sewage treatment facilities.

10. What else does the MWRA do?

The MWRA maintains and operates a huge sewer system to collect wastewater from 43 communities with more than 5,000 miles of local sewer pipes. Two aging treatment plants, one on Deer Island near Winthrop, the other on Nut Island in Quincy, treat wastewater collected from nearly 2 million people and 5,500 businesses before discharging it into Boston Harbor. The worn-out plants, which provide only minimal treatment, have helped to make Boston Harbor among the dirtiest in the nation.

The MWRA is undertaking an 11-year effort to solve the problem. It will construct a new wastewater treatment plant and facilities to capture sewer overflows, renovate the pipes and pumping stations that make up the sewer collection system, and reduce the discharge of toxic chemicals into the system. The Boston Harbor Project is explained in the brochure entitled "How We Plan to Clean the Dirtiest Harbor in America."

For more information call (617) 241-6046.

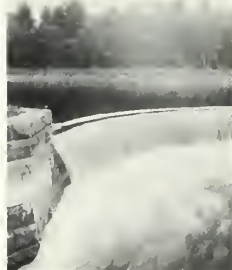
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Working together for clean water.

The MWRA is an independent authority that provides wholesale water and sewer services to 2.5 million people in 60 communities. It is governed by a Board of Directors with representatives appointed by the Governor, the Mayor of Boston, and member communities. The MWRA was created in 1985 by the Governor and the State Legislature to modernize these water and sewer services, to conserve water resources and to improve the water quality of Boston Harbor.

Run as a partnership between the MWRA and the Metropolitan District Commission, the water system provides the region with high quality water from the Quabbin and Wachusett reservoirs.

In 1987, the MWRA began a long-range water supply program to modernize the system, protect existing supplies and promote conservation.



1796: Jamaica Pond

Boston's early settlers relied on water from cisterns and underground wells, but the quality was poor and the supply inadequate. The first attempt to provide an alternative came from a private company: In 1796, the Aqueduct Corporation began delivering water from Jamaica Pond through a system of wooden pipes.

1848: Lake Cochituate

The practice of regularly washing down Boston's streets and alleyways to prevent the spread of disease required more water. Moreover, the city needed water to fight fires. After decades of debate, Boston hired John Jervis, who built a reservoir and aqueduct to supply 18 million gallons of water per day from Long Pond in Natick. Renamed Lake Cochituate, the reservoir was used until 1946.

1878: Sudbury Reservoirs

Due largely to the introduction of indoor plumbing, Boston soon reached the limit of its supply. By 1878, a system of small reservoirs on the Sudbury River was completed. Water from Cochituate, Sudbury and Mystic Lake in Charlestown provided Boston with 69 million gallons per day.

1906: Wachusett Reservoir

In 1893, with population booming, the Legislature directed the State Board of Public Health to devise a means for supplying water to Boston and all suburbs within 10 miles of the State House. The board's chief engineer, Frederic Stearns, recommended creating a reservoir on the Nashua River in Clinton. The result was the Wachusett Reservoir, which began feeding water to the Sudbury system in 1908.

1946: Quabbin Reservoir

Stearns' long-term plans included a giant reservoir still further west. The Wachusett, Sudbury, and Cochituate systems could deliver 169 million gallons of water per day, but a quarter of this water was of poor quality, affected by increased development on the Cochituate and South Sudbury watersheds. After years of debate, most of which concerned the great sacrifice of land and community required for the new reservoir's construction, the plan for Quabbin was approved. The 412 billion-gallon reservoir was completed in 1939 and filled to capacity by 1946.

1989: Quabbin Reservoir, 70% full

Two million people in the metropolitan area depend on water from the Quabbin and Wachusett every day. Designed to provide an average of 300 million gallons per day, the system must now regularly meet demand that exceeds this amount by up to 10%. Consequently, Quabbin's level has gradually fallen since it was last full in 1984. The MWRA is investigating ways to meet the needs of the region by reducing demand through water conservation and by utilizing additional local sources.



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